$$\varphi x = \frac{1}{2\pi} \int_{-\infty}^{\infty} \frac{e^{x\Phi(\omega\sqrt{-1})}\, \mathrm{F}(\omega\sqrt{-1})}{f(\omega\sqrt{-1}, \omega\sqrt{-1})}\, d\omega$$

gives the solution of the problem.

The above-mentioned formulæ are selected out of a great number of very general results contained in the memoir.

III. Letter from Dr. W. Bird Herapath to Professor Stokes, "On the Detection of Strychnia by the formation of Iodostrychnia." Communicated by Professor Stokes, Sec. R.S. Received June 12, 1856.

Bristol, June 7, 1856.

My dear Sir,—Will you do me the favour to announce to the Royal Society, that I have been engaged during some time past in the application of my discovery of the optical properties of iodostrychnia to the detection of this alkaloid in medico-legal inquiries? I find it is perfectly possible to recognize the 10,000th part of a grain of strychnia in pure solutions by this method, even when experimenting on very minute quantities. In one experiment I took $\frac{1}{1000}$th of a grain only, and having produced ten crystals of nearly equal size, of course each one, possessing distinct and decided optical properties, could not represent *more* than the $\frac{1}{10000}$th part of a grain; in fact, it really represents much less, inasmuch as one portion of the strychnia is converted by substitution into a soluble hydriodate, and of course remains dissolved in the liquid.

I had hoped to have been able to complete this matter during this summer, but I now find it impossible to do so in time for this session of the Royal Society. I trust to be able to do so before Christmas, however. Will you oblige me by getting this notice inserted in the 'Proceedings,' as a new test for strychnia at this juncture possesses considerable interest, the colour-tests having been so dubiously spoken of recently by toxicologists?

In order to operate in this experiment, it is merely necessary to use diluted spirit of wine, about in the proportions of one part of spirit

to three of water, as the solvent medium, and to employ the smallest possible quantity of the tincture of iodine as the reagent, and after applying heat for a short time, to set in repose. On spontaneous evaporation or cooling, the optical crystals deposit themselves, and may be recognized by the polarizing microscope, according to the description given of this substance in a former notice to the Society in June last.

You may remember that this proposition was also contained in my paper on iodo-strychnia, which was withdrawn from the Royal Society by me in June last in consequence of a necessity for revision and the completion of experiments requisite to settle the formula of that peculiar substance, and the introduction of an abstract of the literature concerning it.

I remain, &c.,

W. Bird Herapath.

IV. "Dynamical Illustrations of the Magnetic and the Heliçoidal Rotatory Effects of Transparent Bodies on Polarized Light." By Professor W. Thomson, F.R.S. Received May 10, 1856.

The elastic reaction of a homogeneously strained solid has a character essentially devoid of all heliçoidal and of all dipolar asymmetry. Hence the rotation of the plane of polarization of light passing through bodies which either intrinsically possess the heliçoidal property (syrup, oil of turpentine, quartz crystals, &c.), or have the magnetic property induced in them, must be due to elastic reactions dependent on the heterogeneousness of the strain through the space of a wave, or to some heterogeneousness of the luminous motions* dependent on a heterogeneousness of parts of the matter of lineal dimensions not infinitely small in comparison with the wave length. An infinitely homogeneous solid could not possess either of those

* As would be were there different sets of vibrating particles, or were Rankine's important hypothesis true, that the vibrations of luminiferous particles are directly affected by pressure of a surrounding medium in virtue of its inertia.